

ET 805: THE PROCESS CONTROL SYSTEM

Automation with process control system

The steam power plant ET 805 is equipped with a state-of-the-art process control system enabling the automated operation. It is similar to process control systems in industrial power plants. This ensures a highly practice-oriented education.

The plant is equipped with three decentralised programmable logic controllers (PLC) interconnected via field bus (CAN-bus). The first and second PLC control and monitor the steam boiler module and the turbine module. The third PLC controls the synchronous generator (PPU).

The master PLC is connected via an Ethernet interface to the PCs. Additional PCs (e.g. in a training classroom or teacher's office) can be connected. Touch screens at the control station are used to operate the plant.

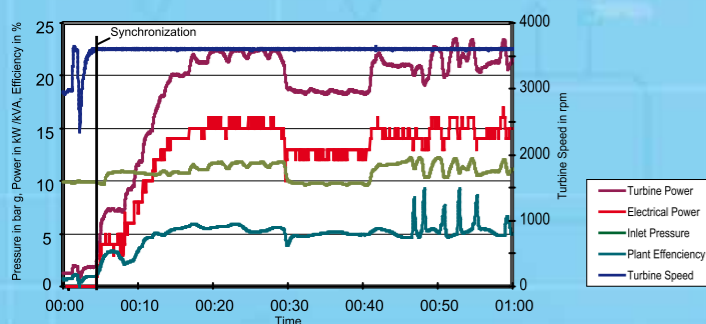
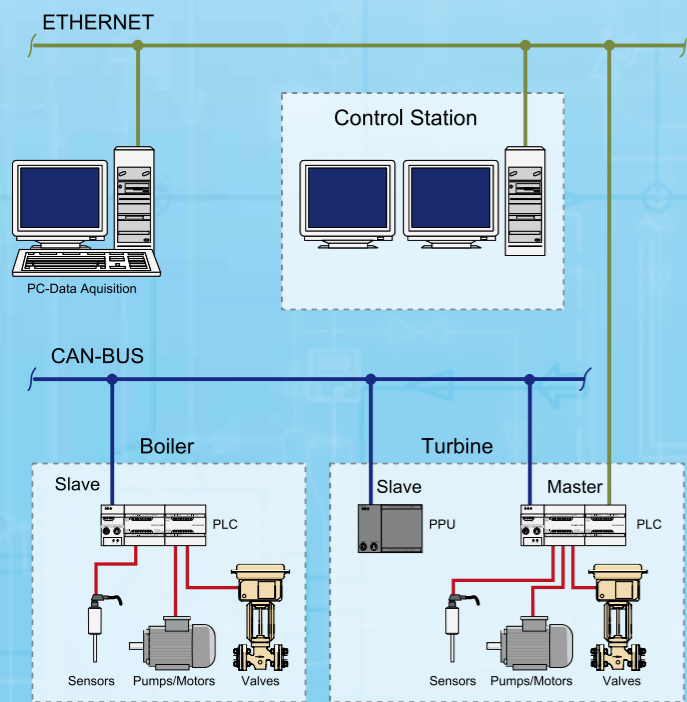
All signals are standard 4 – 20 mA signals. Motorised and solenoid control valves are used as actuators.

Data acquisition

The data acquisition system facilitates logging and evaluation of process parameters. The process schematic displays live data. Calculated values, such as energy flows, are also displayed. This data makes the losses occurring in the steam power cycle clear.

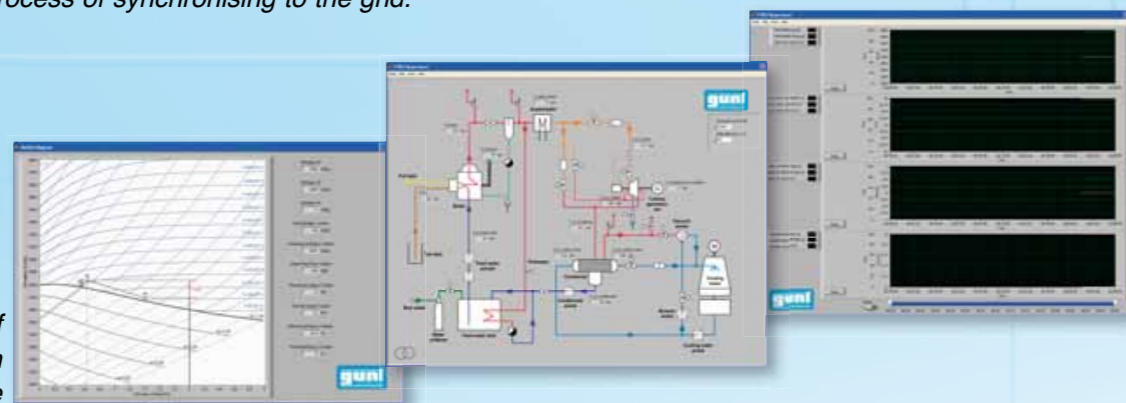
Additionally the live depiction of the turbine process in h-s diagram facilitates easy comprehension of energy transformation.

With the help of spreadsheet programmes (e.g. MS Excel) saved data can be evaluated independently.



The chart shows the process of synchronising to the grid.

Screenshots of data acquisition software



Structure of process control system

To control a complex process such as the steam power cycle the process control software offers both detailed information and a global view.

The most important measured values are constantly displayed on a schematic of the total process. The functioning of all control loops with the respective data history can be observed at the same time.

By clicking on a measured value in the process schematic the associated information is displayed in the parameter list.

Warnings and alarms are directly displayed on the screen.

GENERAL OVERVIEWS: PROVIDING ALL IMPORTANT INFORMATION

Total process with display of important data

Subsystem selection

Overview of control loops

Quick access to all relevant data at any time

Easy navigation

Steam generator

Turbine

Condenser

Generator

Cooling tower

Feed water treatment

SUBSYSTEMS: DETAILED DATA AND OPERATION